

REMARKS

This amendment is in response to the Office Action received in the above referenced application. Upon entry of this amendment claims 1, 3-4, 6, 8, and 10-15 are pending in the application and under consideration.

Claim 1 has been amended to more particularly claim the invention. Specifically, claim 1 is amended to recite the composition of the metal oxide layer and to recite the additional metal silicate layer. Support for the amendment is found in the specification and figures, for example in the text of original claims 2 and 5. Applicant respectfully submits that no new matter is added by this amendment. Claims 3, 4, 6, 10 and 13 are amended to correct changes in dependency given the amendments to the claims made herein.

Claim Rejections 35 U.S.C. §102

The Examiner rejects claims 1-2 under 35 U.S.C. §102(e) as allegedly anticipated by Callegari et al. ("Callegari"). Applicant disagrees and respectfully traverses the rejection.

A claim is anticipated under 35 U.S.C. §102 only if each and every element as set forth in the claim is found, either expressly or inherently described in a single prior art reference.

Callegari teaches a method of fabricating aluminum oxide films by (a) providing an aluminum alkoxide precursor that is dissolved, emulsified or suspended in a liquid; (b) providing a vapor generated from the aluminum alkoxide precursor; and (c) depositing an aluminum oxide film on the substrate at a temperature greater than 500 °C. (see Abstract). In Example 5 and Figures 12A-12H of Callegari, a transistor having an aluminum oxide layer as a component of a multiplayer gate dielectric is shown.

Callegari's teaching is limited solely to aluminum oxide layers. Callegari does not teach or reasonably suggest a method of forming a multilayer dielectric film on a substrate, comprising forming a metal oxide layer atop a metal silicate layer, where the metal oxide layer is selected

from ZrO_2 and HfO_2 as recited in Applicant's amended claims. Applicant respectfully submits that Callegari does not teach each and every element as set forth in Applicant's claim, either expressly or inherently, and thus the rejection under 35 U.S.C. §102(e) should be withdrawn.

Claim Rejections 35 U.S.C. §103

The Examiner rejects claims 3 – 15 under 35 U.S.C. §103(a) as allegedly unpatentable over Callegari, in view of Steigerwald et al. ("Steigerwald"). Applicant disagrees and respectfully traverses the rejection.

To establish a proper prima facie case of obviousness, three criteria must be met. First, there must be some suggestion or motivation, either in the cited references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify or combine the cited reference relied upon by the Examiner to arrive at the claimed invention. Second, there must be a reasonable expectation that the suggested modification or combination would be successful. Finally, the prior art reference (or references when combined) must teach or suggest each and every limitation of the rejected claims. The teaching or suggestion to make the claimed modification or combination and the reasonable expectation of success must both be found in the prior art, and not based upon in the applicant's disclosure. M.P.E.P. §706.02.

As stated above, Callegari does not teach or reasonably suggest Applicant's amended claims. Applicant disagrees with the Examiner's reading of Callegari, specifically in that the metal oxide layer has the formula $MxOy$ and M is selected from a wide range of metals as set forth by the Examiner on the top of page 3 of the Office Action. Callegari teaches that the metal oxide layer *must* contain aluminum oxide, irrespective of what other metals might be present. Also see column 11, lines 23-26 where Callegari teaches in Example 5 that at least one of the layers is aluminum oxide in the multilayer gate dielectric. Callegari does not teach or suggest a metal oxide layer of composition other than aluminum oxide as recited in Applicant's claims.

Applicant respectfully submits that Steigerwald adds nothing more. Steigerwald teaches a process for device fabrication where an organic precursor gas and an inorganic precursor gas

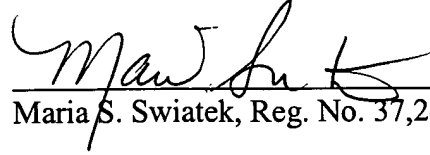
are introduced into the chamber. The organic precursor is an oxygen-containing organic compound that does not favor a reaction with the substrate to form an oxidized semiconductor compound, and the organic precursor gas catalyzes a reaction between the inorganic precursor gas, the organic precursor gas, and the substrate to form a dielectric layer (see column 6, lines 5 – 20). Steigerwald does not teach or reasonably suggest a method of forming a multilayer dielectric film with specific layers of particular composition in particular arrangement as recited in Applicant's claims. Steigerwald's motivation focuses on teaching types of precursors with particular reaction kinetics that prevent the formation of undesirable interface layers (see column 2, lines 17 to 20, and column 3, lines 16-20, among others).

Applicant respectfully submits that Callegari and Steigerwald, either alone or in combination, do not teach or reasonably suggest Applicant's amended claims. Further, Applicant does not see the motivation to combine Steigerwald and Callegari. Callegari teaches certain aluminum alkoxide precursors that are dissolved, emulsified or suspended and then vaporizing such aluminum alkoxide precursors to form an aluminum oxide film at a temperature greater than 500 °C. Steigerwald describes organic oxides as precursors such as alkyl oxides, alkyl phosphine oxides, alkyl sulfoxides and heterocyclic oxides, such as oxanorbomene and oxanorbomadiene. Steigerwald further teaches that temperature, particularly the decomposition temperature (or cracking temperature) of the organic and inorganic precursors is important to achieve the stated purpose of preventing formation of an interfacial layer (see column 6, lines 24-45). Steigerwald goes on to describe various cracking temperatures of the suitable precursors at column 6, lines 45 to 67 and at column 7, lines 1-5. All of the recited temperatures are considerably below 500 °C – the temperature “*floor*” taught by Callegari. Applicant respectfully submits that Callegari and Steigerwald are two very distinct process with different purposes and that there is no motivation to combine them. Assuming *arguendo*, even if one were to combine Callegari and Steigerwald as the Examiner suggests, one would not arrive at Applicant's claims.

Applicant respectfully submits that the application is in condition for allowance. If any matters can be resolved by telephone, the Examiner is invited to call the undersigned attorney at the telephone number listed below. Commissioner is authorized to charge any additional fees to Deposit Account No. 50-2319 (Order No. A-70028-1/MSS (463035-936)).

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